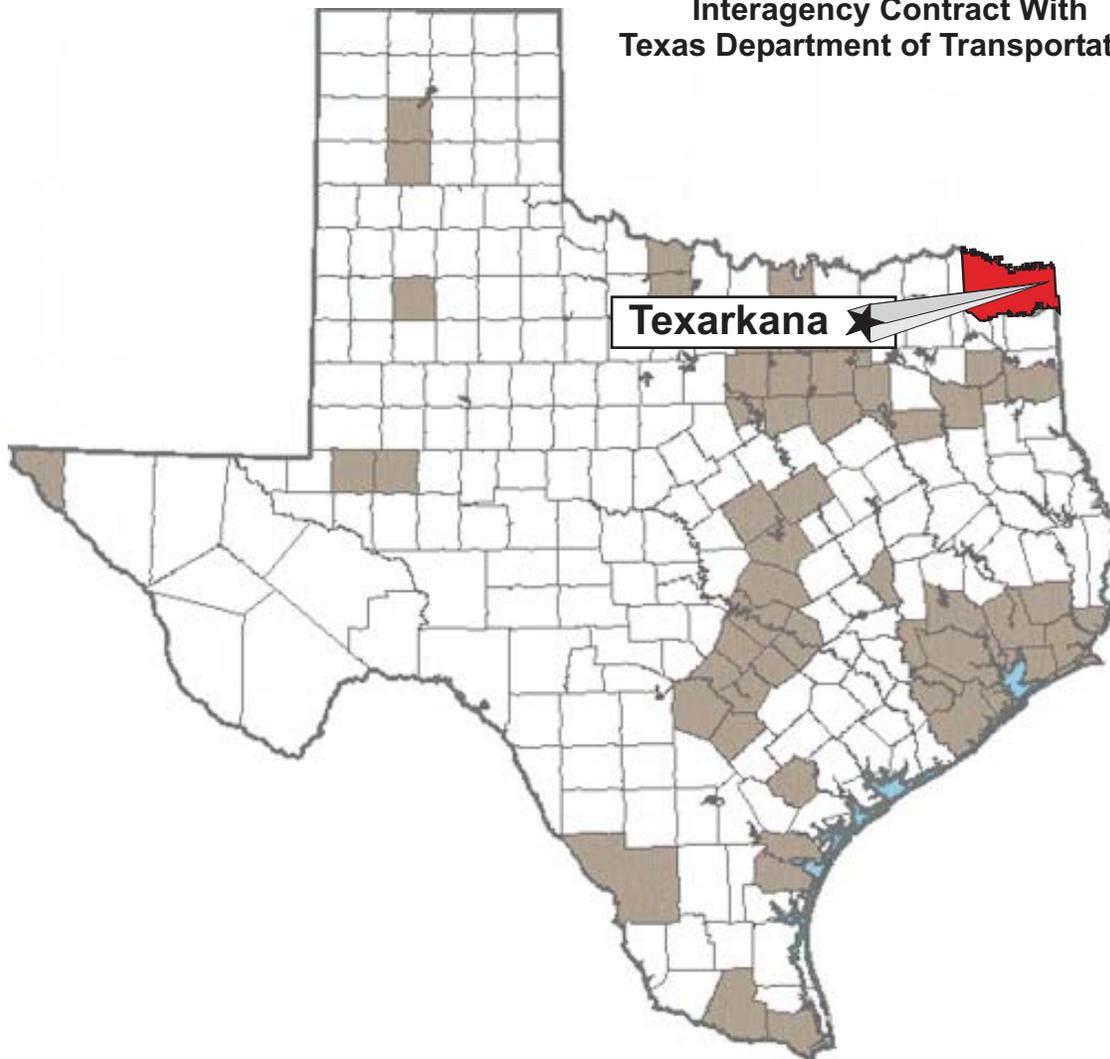


2003 Texarkana External Survey Technical Summary

Interagency Contract With
Texas Department of Transportation



Prepared by the
Texas Transportation Institute
October 2004

2003 Texarkana External Survey

TECHNICAL SUMMARY

Texas Department of Transportation Travel Survey Program

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INTRODUCTION

In 2003 the Transportation Planning and Programming (TPP) Division of the Texas Department of Transportation (TxDOT) funded an external station travel survey in the Texarkana Urban Transportation Study area, which is made up of Bowie County, Texas and Miller County, Arkansas. The survey measured and identified travel patterns into, within, and out of Bowie and Miller counties. The data obtained from the survey will be used in the development and update of the travel demand model for the Texarkana Metropolitan Planning Organization (MPO).

This report serves as a Technical Summary of the 2003 Texarkana External Station Survey and documents the data collected and the analysis results for the Texarkana MPO and the Bowie and Miller county areas.

EXTERNAL STATION SURVEY

An external station survey is a survey of vehicles and/or pedestrians traversing the study area boundary. The survey identifies and measures the characteristics of travel in and out of the study area as well as the travel through the study area. Estimates of travel within the study area by individuals that do not live in the study area are also developed from the survey.

TEXARKANA STUDY AREA AND EXTERNAL LOCATIONS

The boundary established for the Texarkana external survey was the perimeter of Bowie County, Texas and Miller County, Arkansas. The population center of these counties is the cities of Texarkana, Texas and Texarkana Arkansas. There were 16 locations along the perimeter of Bowie and Miller counties identified as external stations. Of these 16 locations, 14 were selected for travel surveys. Figure 1 shows the locations of the external stations around the perimeter of the Texarkana study area. Figure 1 also shows the boundary for the Texarkana Metropolitan Planning Organization (MPO), which covers just beyond the urbanized area of the cities of Texarkana.

There were two external stations not surveyed due to low traffic volumes. These locations were FM 1701 at the Red River county line (station B-11) and FM 114 at the Red River county line (station B-12).

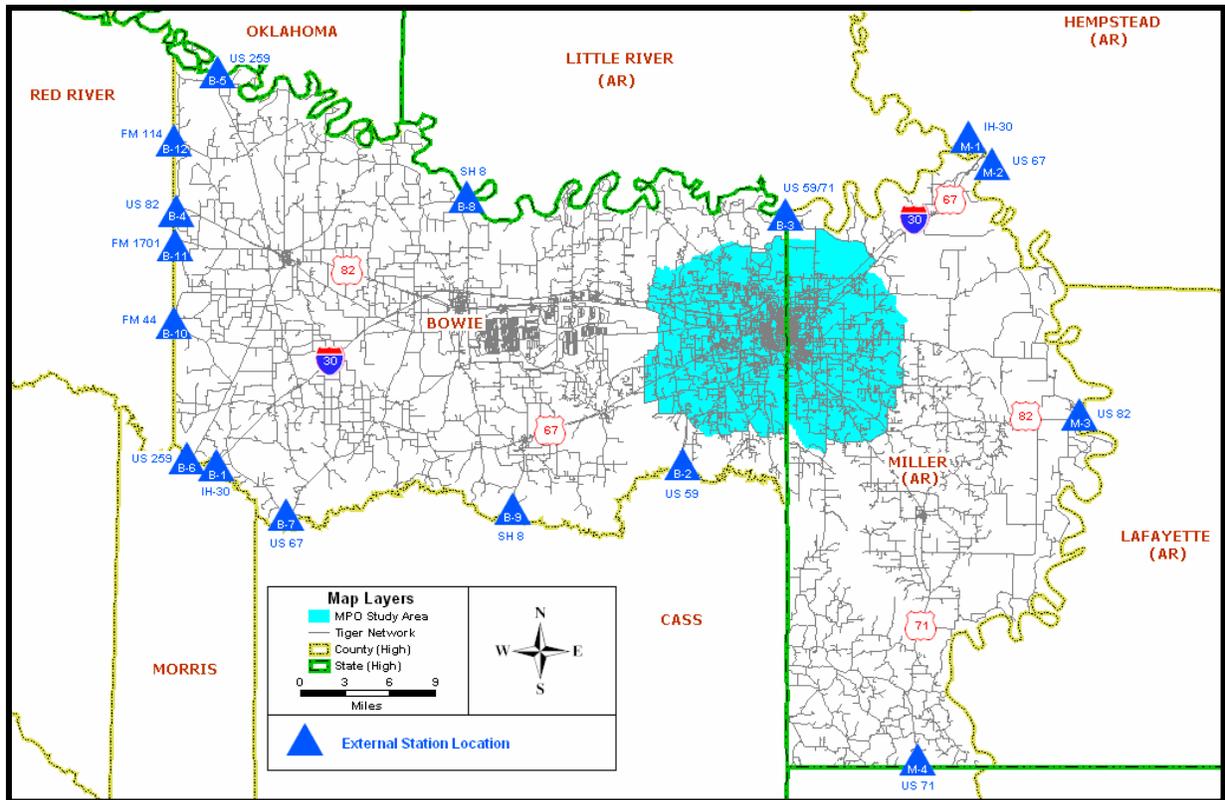


Figure 1. Texarkana Study Area and External Stations.

SURVEY QUESTIONNAIRES

Surveyors used two questionnaires for the survey: one for non-commercial vehicles and another for commercial vehicles. The survey instrument for non-commercial vehicles was used on personal use passenger vehicles such as automobiles, trucks, vans and motorcycles. The survey form for commercial vehicles was used for service and commercial vehicles such as delivery vans, panel vans and multi-axle tractor-trailer trucks. Copies of the non-commercial and commercial vehicle questionnaires used in the survey are shown in the Appendix.

SURVEY METHODS

There were two methods used to conduct the surveys. An intercept interview method was used to conduct surveys of non-commercial and commercial vehicles on roadways with low-to-moderate traffic volumes. For external stations on high volumes roadways, non-commercial vehicles were surveyed using a license plate match method and commercial vehicles were

surveyed at rest areas, weigh stations and truck stops using an intercept interview method. For purposes of this study, roadways with traffic volumes in excess of 20,000 vehicles-per-day were considered high volume.

Intercept Interview Method

Roadside intercept interview surveys were conducted at external stations with low-to-moderate traffic levels by developing a temporary survey station using traffic control devices, warning signs, and flagmen. For each location, a traffic control plan was set up and vehicles traveling in the outbound direction (exiting the study area) were directed to the side of the road and the drivers were asked to participate in the survey. Those declining were allowed to continue on their trip. Trained personnel interviewed those agreeing to participate in the survey. Figure 2 shows an example of an external survey being conducted using the personal interview method. It also shows a typical set-up of a traffic control plan at an external station when this method is used.



Figure 2. Example External Survey Using Intercept Interview Method.

The roadside intercept method was also used to conduct commercial vehicle surveys at rest areas, weigh stations, and truck stops located along high-volume facilities. The surveys were conducted by interviewing drivers of commercial vehicles when they stopped for gas, weighing, or personal reasons. The survey was performed by trained personnel wearing yellow vests, hardhats, and name tags.

The locations where intercept interview surveys were conducted are shown in Table 1. The table shows the number of surveys conducted by external station for non-commercial and commercial vehicles and provides the 24-hour traffic count at each location.

Table 1. Personal Interview Survey Locations.

Station Number	Facility	Location	Vehicles Surveyed		24-Hour Vehicle Count	
			Non-Commercial	Commercial	Inbound	Outbound
B-1	IH-30 West	Morris Co. Line	NA	101	9172	8929
B-2	US 59 South	Cass County Line	NA	45	8369	7830
B-3	US 59/71	TX/AR border	361	54	6010	6025
B-4	US 82 West	Red River County Line	322	69	1388	1385
B-5	US 259 North	TX/OK border	97	43	752	799
B-6	US 259 South	Morris County Line	295	61	779	785
B-7	US 67 South	Cass County Line	279	36	705	624
B-8	SH 8 North	TX/AR Border	298	52	1399	1570
B-9	SH 8 South	Cass Co. Line	292	42	997	958
B-10	FM 44	Red River County Line	36	2	90	95
M-1	IH-30 East	Hempstead County, AR Line	NA	176	10204	10941
M-2	US 67 East	Hempstead County, AR Line	282	55	1305	1329
M-3	US 82 East	Lafayette County, AR Line	325	61	1797	1797
M-4	US 71 South	AR/LA Border	326	56	1846	1735
TOTALS			2913	853	44813	44802

License Plate Match Surveys

There were three external stations in the Texarkana survey area where the intercept interview method could not be used because traffic volumes were too high to safely stop traffic and interview motorists. In lieu of intercept surveys at these locations, a license plate match method was used as a means to estimate the amount of non-commercial vehicles that were traveling through the Texarkana area on high-volume facilities.

The surveys were conducted using high-speed digital cameras which recorded license plates of non-commercial vehicles entering and exiting the study area at each high-volume survey location. As part of the process, plate numbers were recorded directly into a digital file. Estimates of the percentages of non-commercial local and through travel were then developed using a computer program which determined the number of license plate matches between each license plate survey location with all other locations.

Only matches meeting specified criteria that occurred within acceptable time limits between each location were considered valid matches. A more detailed discussion on license plate matching criteria is discussed in the analysis section of this report.

The license plate match method was used at three of the 14 external stations in Texarkana. These locations, shown in Table 2, were identified as high volume and had daily traffic volumes in excess of 20,000 vehicles-per-day. Table 2 shows the number of non-commercial license plates recorded by direction at each survey location.

Table 2. License Match Survey Locations.

Station Number	Facility	Location	Non-Commercial Licenses Recorded	
			Inbound	Outbound
B-1	IH-30 West	Morris Co. Line	5932	4131
B-2	US 59 South	Cass Co. Line	3639	4182
M-1	IH-30 East	Hempstead Co., AR Line	3446	4451

License plate recordings at stations B-1, B-2, and M-1 were made during daylight hours for all lanes of traffic. The recordings were made on the same day that commercial vehicle surveys at rest stops, weigh stations, and/or truck stops were conducted. The information obtained from the license plate recordings included the plate number, state of registration, the time that the license was observed, and the direction of travel. The license plate survey involved no direct contact with motorists, no mail-out/mail back surveys, and no names or addresses were linked to license plates.

For a more detailed discussion and description of the survey methodology and schedule, see the report, *Texarkana External Station Travel Survey*, prepared by GRAM Traffic Counting, Inc., the vendor selected to conduct the survey.

DATA ANALYSIS AND SURVEY RESULTS

The external station surveys in Texarkana were analyzed to determine the amount of non-commercial and commercial vehicle travel going into, out of, and through the Bowie and Miller county areas. Non-commercial vehicles are typically personal use passenger vehicles, trucks, vans, and motorcycles. Commercial vehicles are those used for commercial and services purposes and, in most cases, consist of tractor-trailer trucks.

The surveys at each external station were analyzed to develop results for numerous components of travel and trip-making characteristics for use in the area's travel demand model. Results were developed for the following components of travel:

- development of external-local and external-through trip tables;
- estimates of the number of external trips that are made by non-residents of the study area;
- estimates of the number of internal trips made by non-residents inside the study area; and
- results on the type, purpose, and distribution of travel and on the characteristics of the vehicles traveling in and through the area.

The analysis and results for each category and/or component of travel is provided in the following sections.

External-Local and External-Through Trips

External-local trips and external through trips are important types of trips identified for travel modeling purposes as part of an external survey. An external-local trip, or local trip, is one where either the origin or destination of the trip is in the study area and the other trip end is outside the study area. An external-through trip, or through trip, is one that travels through the study area without stopping, where neither the origin nor the destination is within the study area.

Results for Roadside Intercept Surveys

Table 3 shows the survey results for local and through movements at the external stations where intercept interview surveys were conducted. It should be noted that for some stations, the sum of the local and through trips may not represent the total number of surveys. The difference represents surveys where the respondent refused to answer a question or where the trip data was not clear enough to determine the type of trip.

Table 3. Survey Results of Local and Through Trips for Intercept Sites.

Station Number	Facility	Non-Commercial Vehicle Surveys			Commercial Vehicle Surveys		
		Local	Through	Total	Local	Through	Total
B-1	IH-30 West at Morris Co. line	NA	NA	NA	12	48	60
B-2	US 59 South at Cass Co. line	NA	NA	Na	8	1	9
B-3	US 59/71 at TX/AR border	333	28	361	36	18	54
B-4	US 82 West at Red River Co. line	283	39	322	38	31	69
B-5	US 259 North at TX/OK border	63	34	97	34	9	43
B-6	US 259 South at Morris Co. line	160	135	295	11	50	61
B-7	US 67 South at Cass Co. line	274	5	279	16	20	36
B-8	SH 8 North at AR border	266	32	298	19	33	52
B-9	SH 8 South at Cass Co. line	276	16	292	29	13	42
B-10	FM 44 at Red River Co. line	35	1	36	1	1	2
M-1	IH-30 East at Hempstead Co., AR. Line	NA	NA	NA	0	98	98
M-2	US 67 East at Hempstead Co., AR line	269	13	282	37	18	55
M-3	US 82 East at Lafayette Co., AR line	291	34	325	49	12	61
M-4	US 71 South at AR/LA border	258	68	326	27	29	56
Totals		2508	405	2913	317	381	698

Results for License Plate Match Surveys

The number of local and through movements for non-commercial vehicle travel at high-volume survey locations was estimated using high-speed digital cameras to record license plates and then using a computer program to match plates between high-volume external stations. As part of the analysis of license data, a match was considered valid if at least five of six characters in consecutive order on a plate were matched. A match between two stations was only counted as a through trip if it occurred within a specified time limit established for movements between the stations.

Travel time runs were made for the AM peak, Off-peak, and PM peak periods to establish reasonable and acceptable time limits for a through vehicle to travel between license plate survey stations. Table 4 shows the travel times used for the analysis of license data.

Table 4. Travel Times.

Movement	Travel Time in Minutes		
	AM Peak	Off Peak	PM Peak
IH 30 East to IH 30 West	29	32	29
IH 30 West to IH 30 East	30	28	25
US 59 South to IH 30 West	33	23	27
US 59 South to IH 30 East	33	32	29
IH 30 East to US 59 South	31	27	25
IH 30 West to US 59 South	16	15	23

The travel times were increased by 20 percent for peak periods and 10 percent for the off peak to account for variation in travel speeds among motorists.

Table 5 shows the total number of license plates that were matched between all high-volume external stations where license plates were recorded. The numbers in Table 5 represent an estimate of the proportion of local and through movements on IH 30 and US 59 in the Texarkana area.

Table 5. Results of Non-Commercial Through Movements on High Volume Roadways Using License Match.

License Recorded Route		Through Trips / Licenses Matched	Local Trips / Unmatched Licenses
From	To		
IH 30 East (M-1), 3446 licenses recorded.	IH 30 West (B-1)	349	3097 (IH 30 Westbound)
	US 59 South (B-2)	3	
IH 30 West (B-1), 5932 licenses recorded	IH 30 East (M-1)	632	5297 (IH 30 Eastbound)
	US 59 South (B-2)	3	
US 59 South (B-2), 3639 licenses recorded.	IH 30 East (M-1)	3	3627 (US 59 Northbound)
	IH 30 West (B-1)	9	

Figure 3 shows the percentages of license plates recorded by facility and state of registration for Texas, Arkansas, and all other states combined. This figure includes and illustrates data for all licenses plates recorded at all high-volume survey locations.

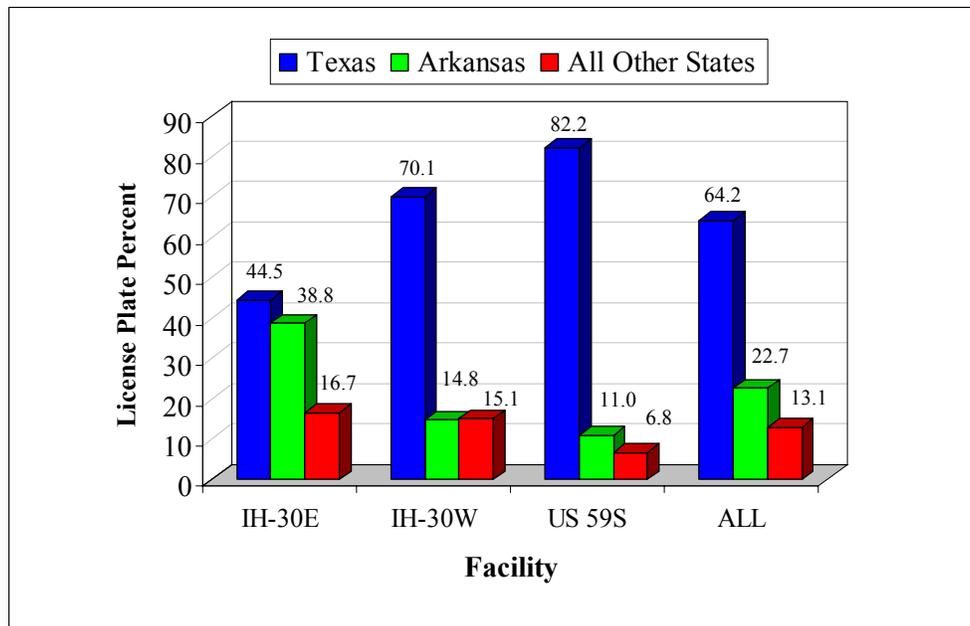


Figure 3. Distribution of Licenses by State and Facility.

Resident Verses Non-Resident Trips

A second type of trip identified in the survey is a sub-category of external local non-commercial trips and are reported as residential and non-residential trips. A resident is a survey respondent that reported they resided in Bowie County, Texas or Miller County, Arkansas. A non-resident is a respondent that reported they lived outside of one of these two counties. Table 6 shows the survey data by residents and non-residents as well as the number of trips made by non-residents within the study area. An important element of the trips reported by non-residents is the number of trips made prior to being surveyed. Based on the information provided in the survey, these trips are evaluated to estimate the number of internal trips, trips where both the origin and destination are within Bowie or Miller counties, made by non-residents. By measuring the number of non-residents that travel in and out of Miller and Bowie counties and the number of internal trips they make, an estimate of the total internal trips within these counties attributable to non-residents can be developed.

The residency questions were only applicable to non-commercial vehicles at external locations where intercept surveys were conducted. Table 6 indicates that individuals who do not live in the county make a high proportion, 79.01 percent, of the non-commercial travel in and out of Miller and Bowing counties. The number of internal trips made by those individuals was very small (only 0.377 trips per vehicle).

Table 6. Survey Results by Residency (Non-Commercial Vehicles Only).

Station Number	Facility	Residents	Percent	Non-Residents	Percent	Internal Trips (non-residents)
B-3	US 59/71 at TX/AR border	82	24.6	251	75.4	194
B-4	US 82 West at Red River Co. line	37	13.1	249	86.9	15
B-5	US 259 North at TX/OK border	9	14.3	54	85.7	15
B-6	US 259 South at Morris Co. line	11	6.9	149	93.1	1
B-7	US 259 SouthUS 67 South at Cass Co. line	36	13.1	238	86.9	25
B-8	SH 8 North at AR border	32	12.0	234	88	26
B-9	SH 8 NorthSH 8 South at Cass Co. line	29	10.5	247	89.5	37
B-10	FM 44 at Red River Co. line	0	0	35	100	0
M-2	US 67 East at Hempstead Co., AR line	99	36.8	170	63.2	141
M-3	US 82 East at Lafayette Co., AR line	86	29.6	205	70.4	202
M-4	US 71 South at AR/LA border	106	41.1	152	58.9	91
Total		527	20.99	1984	79.01	747

Travel Purpose

To understand the reasons people travel, the survey included questions about the driver’s purpose for being at the location where the trip began (i.e., trip origin) and the purpose for traveling to their destination. There were 15 different purposes included on the survey instrument for non-commercial vehicles and eight purposes on the commercial vehicle survey. Table 7 provides the trip purposes for each survey. For the purpose of presenting survey results, the trip purpose categories are combined into a fewer number to reflect the primary purposes of travel.

Table 7. Trip Purpose Categories.

Code	Non-Commercial Vehicle Trip Purpose	Code	Commercial Vehicle Trip Purpose
1	Home/Return Home	1	Base location/Return to Base
2	Go/Return to Work	2	Delivery
3	Work Related	3	Pick Up
4	School	4	Maintenance
5	Vacation	5	Driver Needs (lunch, etc.)
6	Visit Friends/Family	6	To Home
7	Eat Out	7	Buy Fuel
8	Shop	8	Other
9	Buy Gas	99	Refused/Unknown
10	Personal Business		
11	Pick Up/Drop Off Passenger		
12	Change Travel Mode		
13	Delivery		
14	Other		
15	Refused/Unknown		

For non-commercial vehicles, the trip purposes listed in Table 7 were combined into the following six categories:

<u>Category</u>	<u>Trip Purpose Codes (from Table 7)</u>
Home	1
Work	2 and 3
School	4
Personal	5, 6, 10, and 11
Shop	7, 8, and 9
Other	12, 13, 14, and 15

Figure 4 shows the distribution of non-commercial vehicles by reported trip purpose at the origin of the trip and Figure 5 shows the distribution of non-commercial vehicles at the destination of the trip. The distribution for the origin purpose shows that the majority of the trips, 35 percent, were for shopping, while 25 percent were for work, and 22 percent began at home. A total of 43 percent of the trips destinations were to return home, 26 percent were for personal reasons, and 25 percent were for work or work-related reasons.

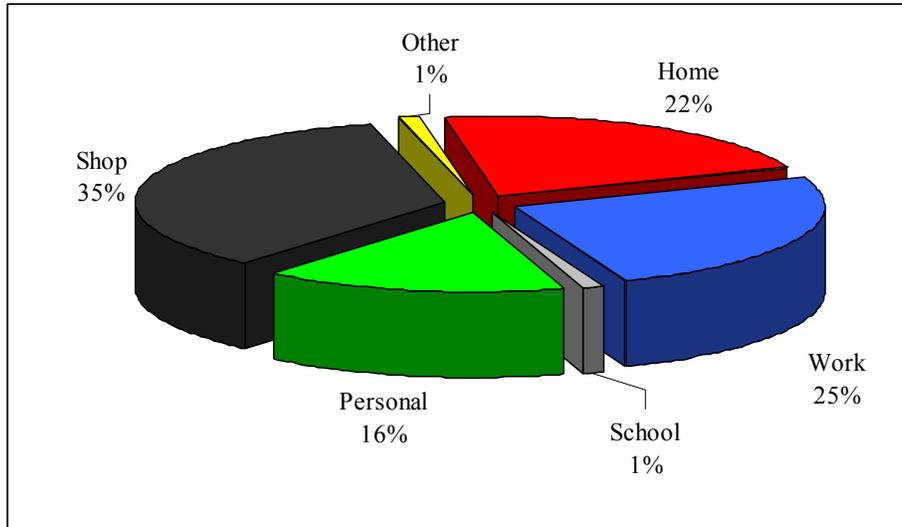


Figure 4. Trip Purpose Origins for Non-Commercial Vehicles.

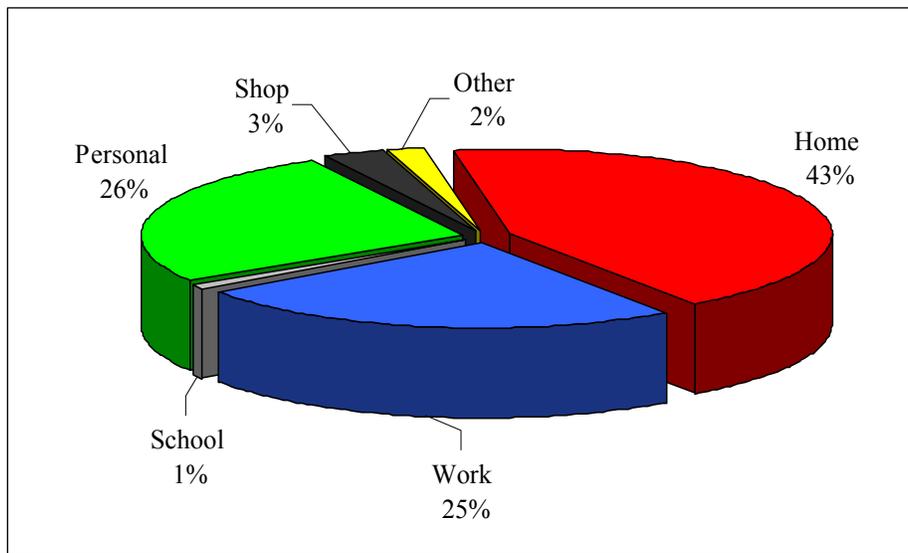


Figure 5. Trip Purpose Destinations for Non-Commercial Vehicles.

For travel demand modeling uses, the above trip purpose categories were combined into home-based work (HBW), home-based non-work (HBNW), and non-home based (NHB) categories. HBW trips are those where one trip end is at home and the other is at the workplace, while HBNW trips have one trip end at home and the other at locations other than the workplace. NHB trips are those where neither trip end is at home. The distribution of all trips by HBW, HBNW, and NHB trip categories is shown in Figure 6. The majority of the trips, 43.2 percent, were

HBNW, which would include all trips with one trip end at home and the other trip end at some place other than work. HBW and NHB trips comprised 21.1 percent and 35.7 percent of the trips, respectively.

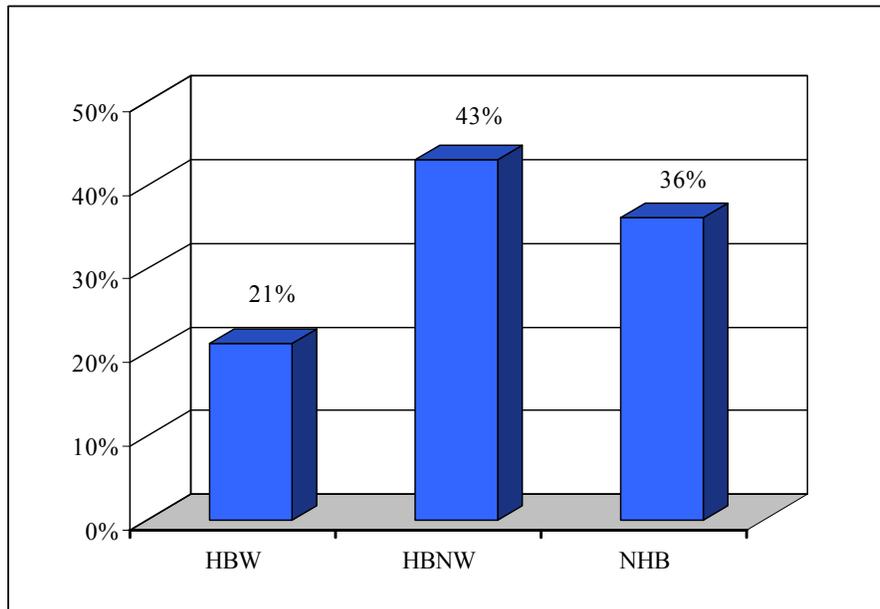


Figure 6. Distribution of Non-Commercial Vehicle Trips by Trip Purpose.

For commercial vehicles, the trip purposes shown in Table 7 were combined into the following five categories:

<u>Category</u>	<u>Trip Purpose Codes</u>
Base Location	1
Delivery	2
Pick Up	3
Support Functions	4, 5, 6, and 7
Other	8 and 99

Figures 7 and 8 present the distribution of commercial vehicle trips by reported trip purpose at the origin and destination of the trips. The distribution of commercial trips by purpose at the trip origin shows delivering and picking-up cargo at 33 and 23 percent, respectively. A total of 30 percent of the trips were for support functions (i.e., maintenance, purchase fuel, attend driver needs, or home) and 10 percent were to travel to their base location. The distribution for

destination trip purpose shows that the majority of the surveyed vehicles, 51 percent, were destined for delivering cargo and another 31 percent were destined for picking up cargo.

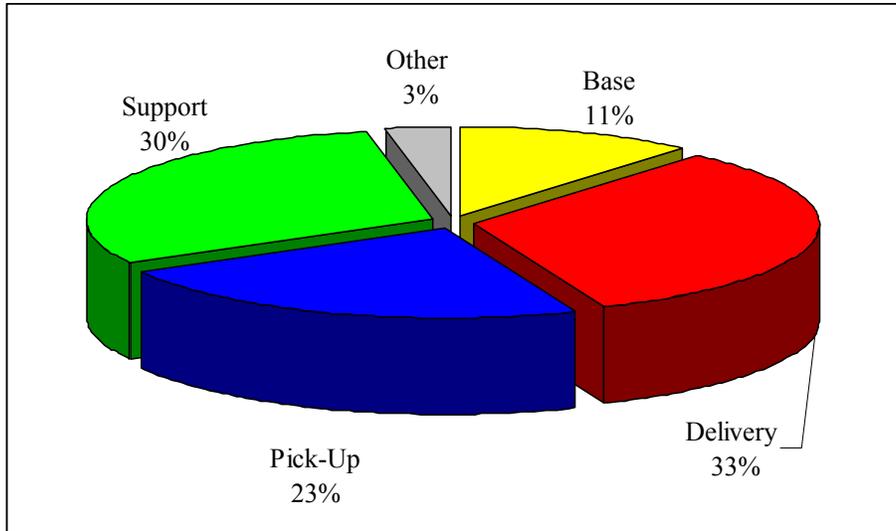


Figure 7. Trip Purpose Origins for Commercial Vehicles.

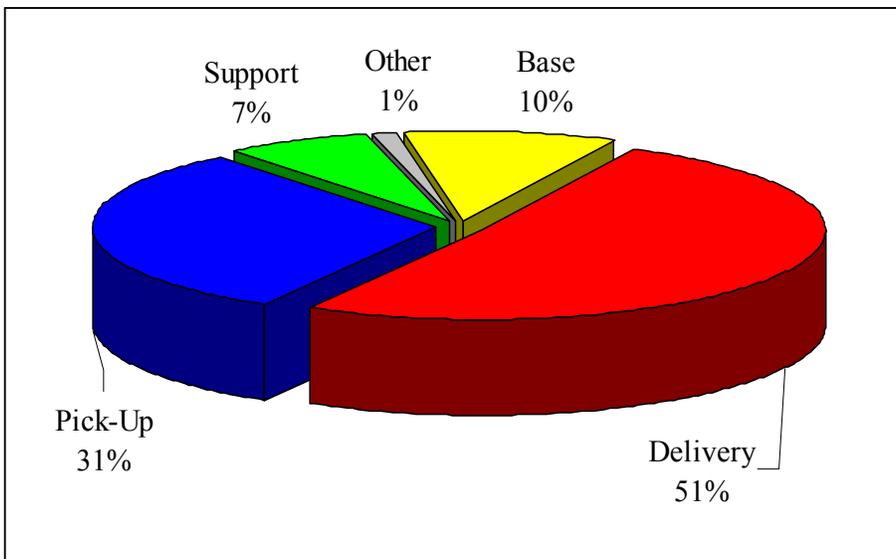


Figure 8. Trip Purpose Destinations for Commercial Vehicles.

Vehicle Counts by Type and Time-of-Day

Vehicle classification counts were conducted at each external station on the same day that the survey was conducted. The counts were taken for a 24-hour period and provide information on

the number and type of vehicles coming into and going out of the Texarkana study area. This information is primarily used for expansion of the survey data, but is also of interest to examine the distribution of vehicles by time-of-day. Figure 9 shows the vehicle counts for each location broken down by non-commercial and commercial vehicles.

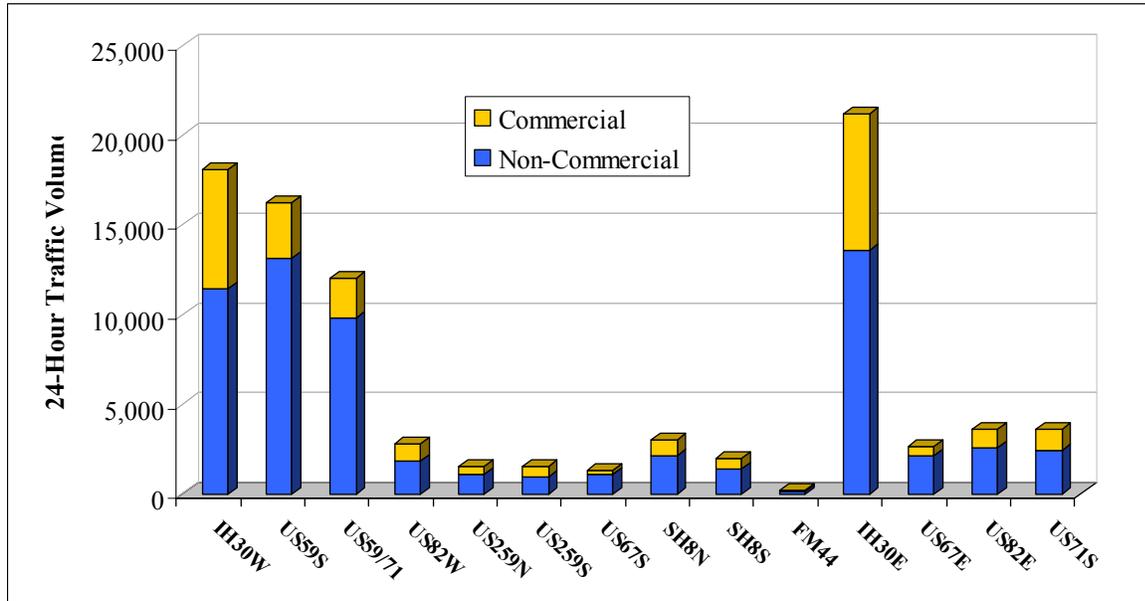


Figure 9. External Station Traffic Volumes by Type.

Figure 9 shows that Interstate Highway 30 and US 59 carry the large majority of non-commercial and commercial vehicles entering and exiting the Texarkana area.

Figure 10 shows the distribution of non-commercial and commercial vehicles by time-of-day for vehicles traveling into the Texarkana area. Figure 11 shows the traffic count data for vehicles traveling out of the Texarkana study area.

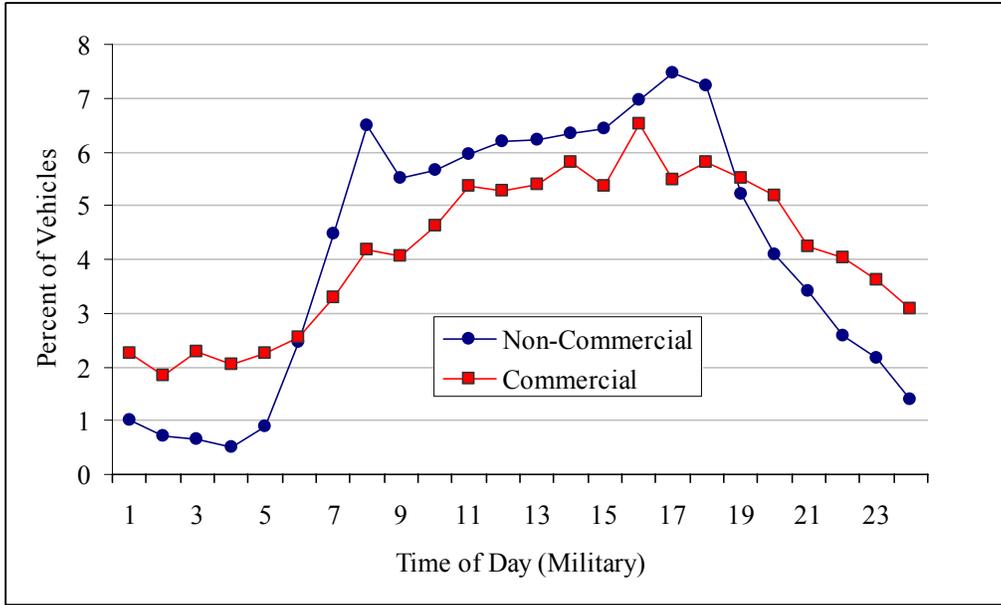


Figure 10. Distribution of Inbound Vehicles by Time-of-Day.

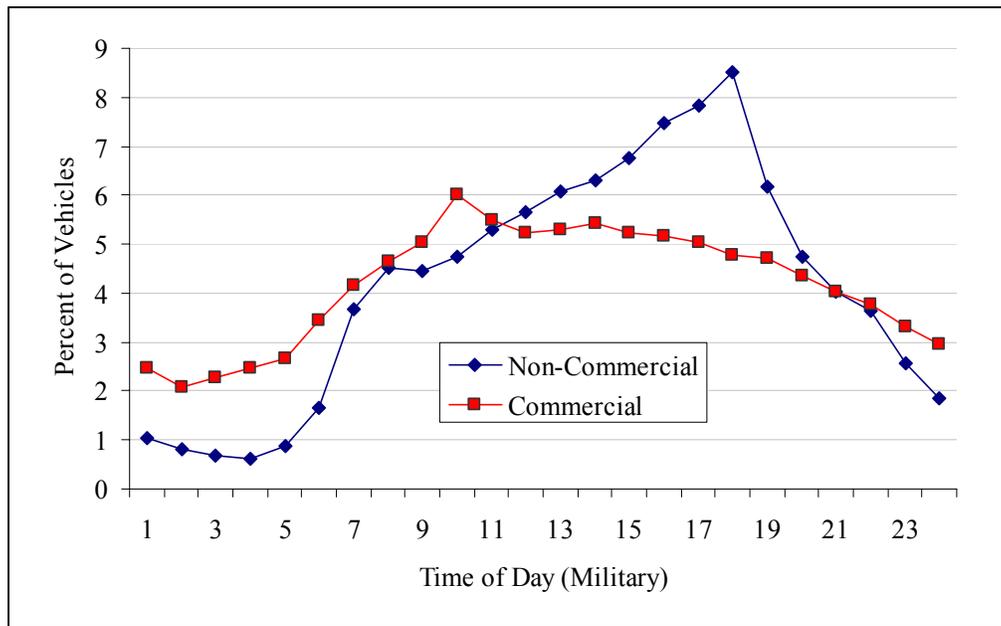


Figure 11. Distribution of Outbound Vehicles by Time-of-Day.

Figure 10 shows noticeable AM and PM peaks for inbound non-commercial vehicles, but shows only slight peaks for commercial vehicle traffic traveling into the Texarkana area. Figure 11 reveals a slight morning peak for both non-commercial and commercial vehicles traveling in the outbound direction. For the PM peak, the figure shows an obvious peak for non-commercial vehicles but no peak for outbound commercial vehicles. The graphics show the morning peak occurring between 6:00 a.m. and 8:00 a.m. and an evening peak between 4:00 p.m. and 6:00 p.m. They show that commercial vehicle traffic is generally spread more evenly throughout the day than non-commercial traffic, which shows peaking characteristics consistent with typical working hours.

Vehicle Characteristics

As part of the survey, interviewers collected data on the year, make, odometer readings, and model of each vehicle surveyed. This provides an indication of the distribution of vehicles traveling through the external stations by type, age, and condition (as implied by the number of miles on the vehicle). Figure 12 represents the distribution of non-commercial and commercial vehicles by age as reported in the surveys. The average age was 7.99 years for non-commercial vehicles and 6.99 years for the commercial vehicles.

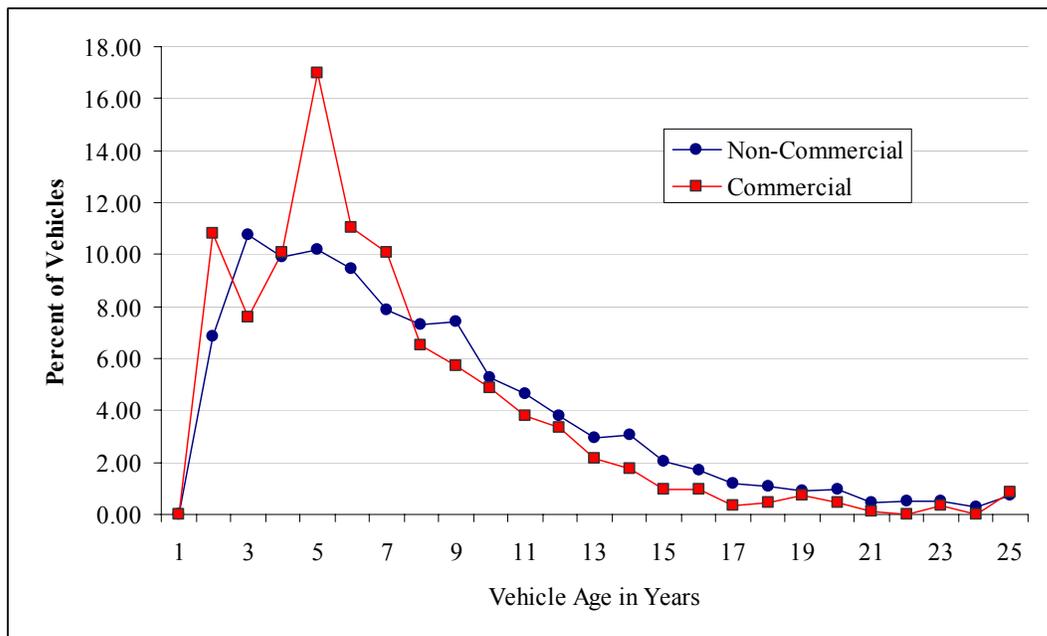


Figure 12. Distribution of Surveyed Vehicles by Age of Vehicle.

Figure 13 shows the average odometer reading for non-commercial and commercial vehicles by age. This data shows the difference in mileage accumulation rates of commercial vehicles as compared to non-commercial vehicles. The data for commercial vehicles do not show smooth trends for older models due to a small number of observations in the survey. Table 8 shows the numerical values for the data plotted in Figure 13. The average odometer reading for commercial vehicles of 371,601 was over three times greater than the average for non-commercial vehicles, which was 98,390.

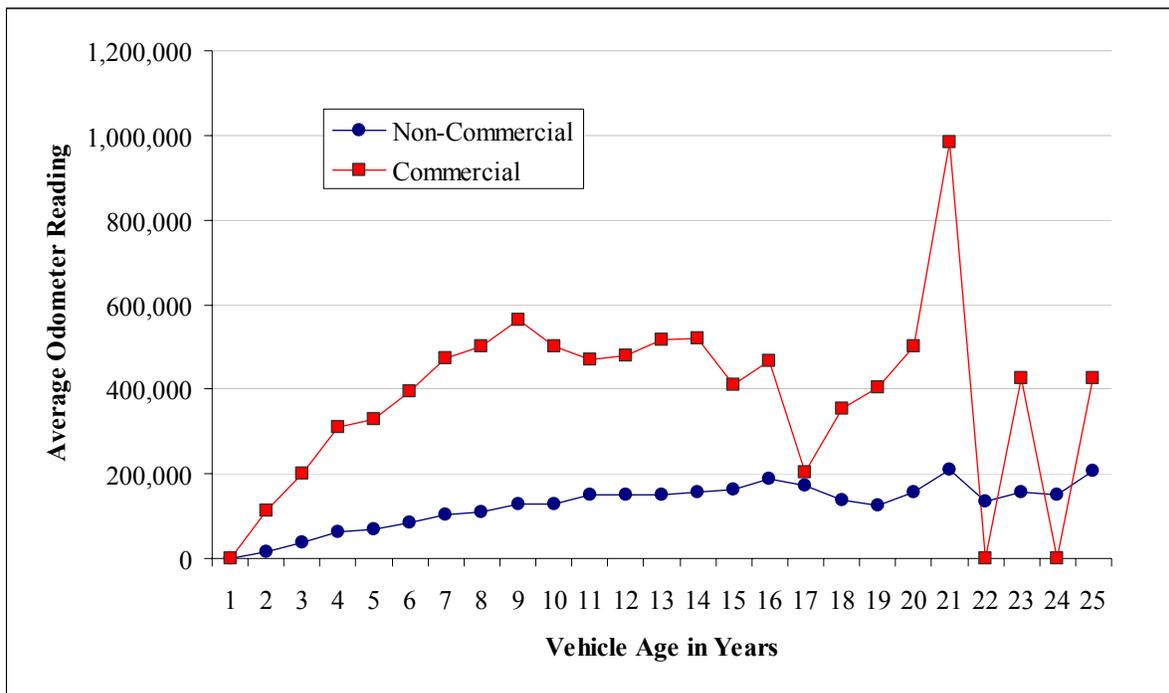


Figure 13. Average Odometer Readings for Vehicles by Age of Vehicle.

Table 8. Distribution of Surveyed Vehicles by Age and Average Odometer Readings.

Vehicle Age	Non-Commercial Vehicles	Average Odometer Reading	Commercial Vehicles	Average Odometer Reading
1	199	15761	91	113058
2	313	37994	64	200712
3	289	63816	85	311495
4	296	69155	143	328286
5	275	85706	93	395660
6	230	102254	85	471692
7	213	110817	55	499783
8	216	127050	48	562668
9	154	129625	41	502708
10	136	149774	32	470702
11	111	150741	28	480644
12	86	150852	18	516526
13	89	156640	15	520505
14	60	163035	8	409609
15	49	187756	8	466745
16	35	173768	3	202830
17	32	139221	4	353191
18	27	125131	6	404176
19	28	157349	4	501861
20	14	211348	1	984000
21	15	135043	0	0
22	15	156137	3	425678
23	9	150459	0	0
24	22	206871	7	426326
25+	0	NA	0	NA

Vehicle Occupancy

As vehicles were surveyed, one of the data items recorded was the class or type of vehicle and the number of persons in the vehicle. This information provides a means for estimating the number of persons traveling in and out of Miller and Bowie counties. Table 9 shows the number of observed non-commercial and commercial vehicles by class and the average occupancy of each. The average occupancy was 1.46 for non-commercial vehicles and 1.05 for commercial vehicles.

Table 9. Distribution of Vehicles by Class and Average Occupancy.

Non-Commercial			Commercial		
Vehicle Classification	Observed Vehicles	Average Occupancy	Vehicle Classification	Observed Vehicles	Average Occupancy
Passenger Vehicles	2859	1.46	Single Unit – 2 Axle 6 Wheels	75	1.07
Bus	27	1.63			
Taxi/Paid Limo	4	1.5	Single Unit – 3 Axle 10 Wheels	25	1.08
School Bus	0	N/A			
Motorcycle	9	1.22	Single Unit – 4 Axle 14 Wheels	41	1.05
Recreational Vehicle	8	1.5			
Other	1	1.0	Semi-Tractor Trailer Combinations	706	1.17
			Other	0	NA

Commercial Vehicle Cargo

Commercial vehicles represent a major component of travel into, out of, and through Miller and Bowie counties. Questions were included in the commercial vehicle survey to obtain information on the type of cargo being transported, where the cargo was picked up and its destination, and how the load was transported to the vehicle. Table 10 shows the number of commercial vehicles surveyed by survey site, the number of vehicles carrying cargo, and whether or not the freight was Mexico cargo (e.g. originated from or destined to Mexico).

Table 10. Commercial Vehicles with No / Mexico Cargo.

Station Number	Facility	Surveyed Vehicles	Empty Vehicles	Vehicles with Mexico Cargo
B-1	IH-30 West at Morris Co. line	101	48	1
B-2	US 59 South at Cass Co. line	45	5	0
B-3	US 59/71 at TX/AR border	54	24	0
B-4	US 82 West at Red River Co. line	69	23	2
B-5	US 259 North at TX/OK border	43	21	1
B-6	US 259 South at Morris Co. line	61	32	0
B-7	US 67 South at Cass Co. line	36	10	0
B-8	SH 8 North at AR border	52	25	0
B-9	SH 8 South at Cass Co. line	42	20	0
B-10	FM 44 at Red River Co. line	2	2	0
M-1	IH-30 East at Hempstead Co., AR. Line	176	24	2
M-2	US 67 East at Hempstead Co., AR line	55	22	0
M-3	US 82 East at Lafayette Co., AR line	61	27	0
M-4	US 71 South at AR/LA border	56	29	0
Totals		853	312	6

Of the 853 commercial vehicles surveyed, 541 were carrying cargo and the remaining 312 commercial vehicles were empty. Only 6 of the 541 vehicles carrying cargo indicated that their cargo had originated from or was destined to Mexico.

Table 11 shows the type of cargo being transported by surveyed commercial vehicles. Approximately 37 percent of commercial vehicles were empty. For those with freight, the cargo classifications reported most were manufactured goods (18 percent), wood products (17 percent), and food/health/beauty products (17percent).

Table 11. Distribution of Commercial Vehicles by Type of Cargo.

Type of Cargo	Number of Vehicles	Percent of Vehicles
Farm products	24	4.44
Forest Products	11	2.04
Marine Products	2	.37
Metals and Minerals	21	3.89
Food, Health, and Beauty Products	90	16.67
Tobacco Products	0	0.00
Textiles	7	1.30
Wood Products	91	16.85
Printed Matter	4	.74
Chemical Products	16	2.96
Refined Petroleum or Coal Products	12	2.22
Rubber, Plastic, and Styrofoam Products	36	6.67
Clay, Concrete, Glass, or Stone Products	38	7.04
Manufactured Goods/Equipment Products	95	17.59
Wastes	4	.74
Miscellaneous Shipments	38	7.04
Hazardous Materials	12	2.22
Transportation Products	18	3.33
Unclassified Cargo	21	3.89
Refused to Answer	1	.18
Unknown to Driver	0	0.00
Empty	312	
Totals	541	100.00

A graphical illustration of the reported types of cargo provided in Table 11 is shown in Figure 14. It shows distribution of commercial vehicle by type of cargo being transported.

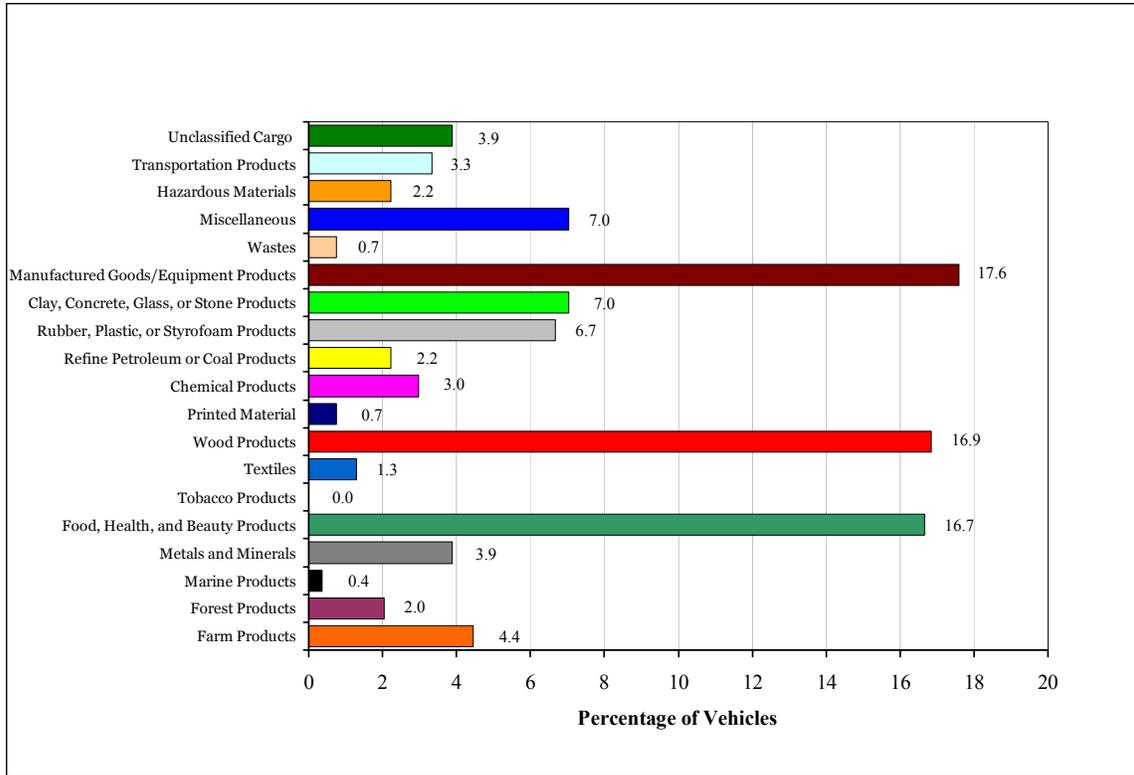


Figure 14. Distribution of Commercial Vehicles by Type of Cargo.

The commercial vehicle survey collected information on how cargo is transferred between various transportation modes. Figures 15 and 16, respectively, show the distribution of surveyed commercial vehicles by the type of transfer for their cargo at the origin (point of pick up) and at their destination (point of delivery). The large majority of cargo transfers were made from warehouse to truck. The second most reported transfer was from truck to truck and the third was from pipeline to truck.

Only eight of the 541 commercial vehicles that were carrying cargo reported that their cargo was transferred from or to a ship or airplane.

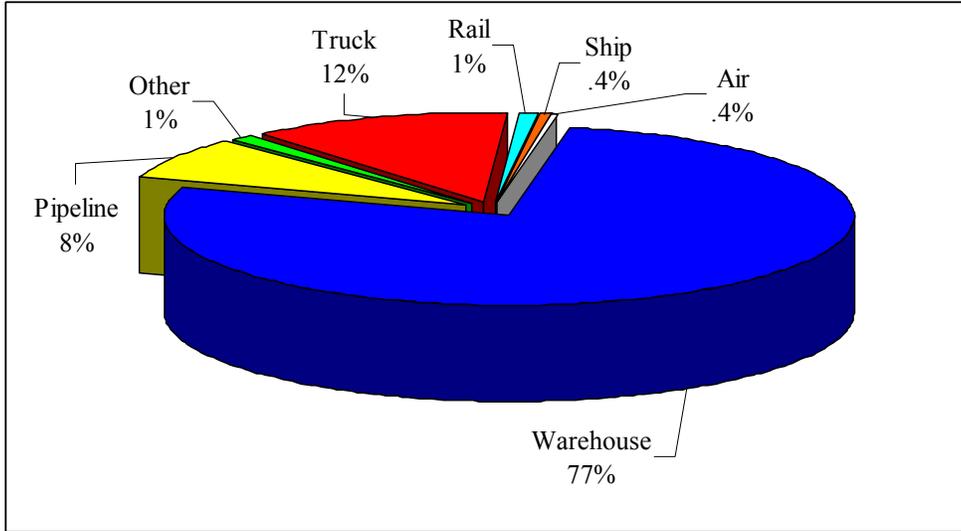


Figure 15. Distribution of Commercial Vehicles by Transfer at Point of Cargo Pick-Up.

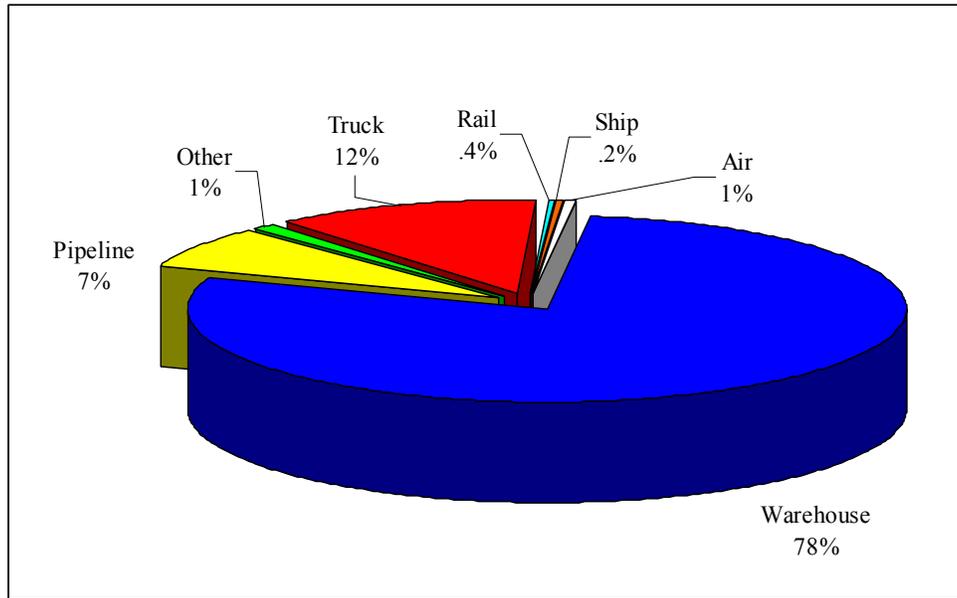


Figure 16. Distribution of Commercial Vehicles by Cargo Transfer at Point of Cargo Pick-Up.

EXPANDED VEHICLE SURVEY

The survey data from all external stations were expanded based on the 24-hour directional vehicle classification counts taken at each site on the day of the survey. In expanding the survey data to the count totals, it is assumed that the traffic in the non-surveyed direction is a mirror image of the traffic in the surveyed direction. For example, if 12 percent of surveyed traffic in the outbound direction was through trips, it is assumed that 12 percent of the traffic in the inbound direction was through trips.

Table 12 shows the expanded estimates of external-local and external-through trips for non-commercial and commercial vehicles by site. This table also shows the estimates of trips by residents and visitors (non-residents) in the Texarkana area. The breakdown of non-commercial trips for all surveyed sites combined is 23.3 percent residents and 76.7 percent non-residents. The percentage of local verses through trips for all sites combined is 75.9 percent local and 24.1 percent through.

The shaded cells in Table 12 represent estimates that were developed considering results for all sites combined because survey data was not available to develop these data items. The estimates of residents and non-resident totals at stations B-1, B-2, B-11, B-12, and M-1 were developed by applying the percentages of residents and non-residents for all other sites combined to the non-commercial vehicle count total for these sites obtained from the 24-hour vehicle classification counts. Information on residency status was not obtained at sites B-1, B-2, and M-1 because these were license plate match survey locations.

Neither intercept nor license match surveys were conducted at stations B-11 and B-12. The percentage of local verses through trips at these locations was developed by applying the percentages of local verses through trips by type to the 24-hour vehicle classification count totals obtained at these sites. Figure 17 shows a comparison of the amount of local verses through traffic at each external station in the Texarkana area.

Table 12. Expanded Survey Results by Station.

Station Number	Facility	Non-Commercial			Commercial			Resident	Visitor
		Local	Thru	Total	Local	Thru	Total		
B-1	IH-30 West at Morris Co. line	7488	390	7878	2929	7291	10220	1831	6047
B-2	US 59 South at Cass Co. line	12014	382	12397	2214	1589	3802	2881	9516
B-3	US 59/71 at TX/AR border	9199	775	9974	1373	688	2061	2456	7518
B-4	US 82 West at Red River Co. line	1731	238	1970	443	360	803	258	1712
B-5	US 259 North at TX/OK border	656	427	1083	38	430	468	155	928
B-6	US 259 South at Morris Co. line	555	472	1027	95	441	537	71	956
B-7	US 67 South at Cass Co. line	1096	46	1142	89	97	187	150	991
B-8	SH 8 North at AR border	1931	247	2178	260	531	791	262	1916
B-9	SH 8 South at Cass Co. line	1359	77	1436	362	157	519	151	1285
B-10	FM 44 at Red River Co. line	141	10	151	17	17	34	0	151
B-11	FM 1701 at Red River Co. Line	300	25	325	20	30	50	76	249
B-12	FM 114 at Red River Co. Line	122	11	133	7	11	18	31	102
M-1	IH-30 East at Hempstead Co., AR. Line	9461	438	9898	3696	7550	11247	2300	7598
M-2	US 67 East at Hempstead Co., AR line	2031	99	2130	337	166	503	784	1346
M-3	US 82 East at Lafayette Co., AR line	2373	277	2650	758	186	944	783	1867
M-4	US 71 South at AR/LA border	2011	509	2520	529	532	1061	1035	1485
TOTAL		52468	4424	56892	13667	20079	33246	13223	43669

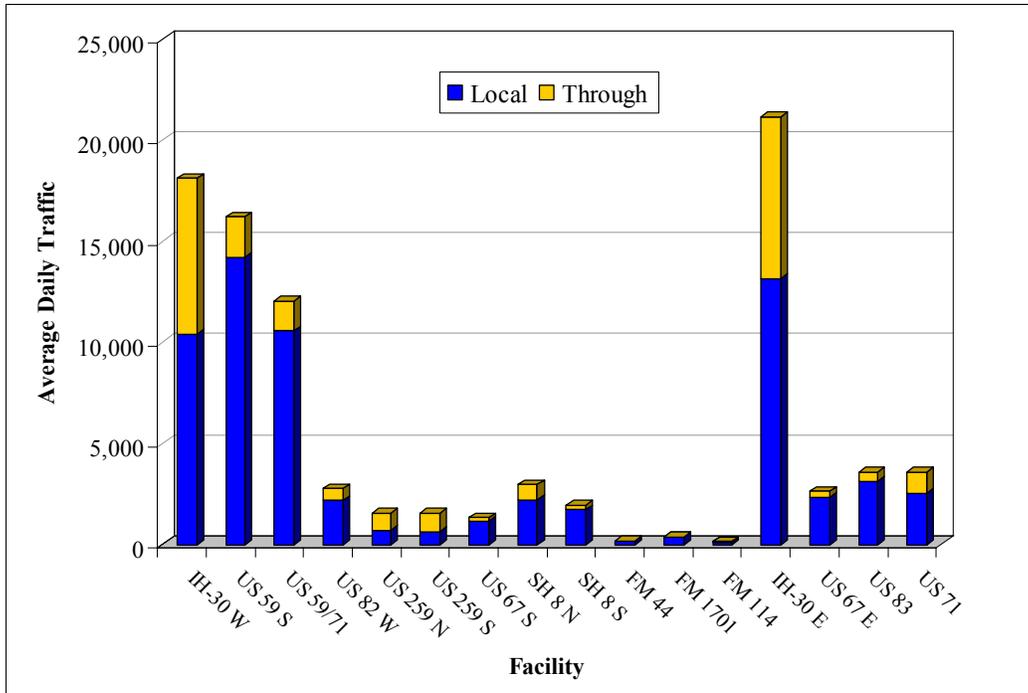


Figure 17. Comparison of Local Verses Through Traffic by Facility.

The expanded survey data were used to develop zone-to-zone estimates of non-commercial and commercial vehicle trips based on the geocoded origins and destinations for the surveyed trips. Trips for the non-surveyed sites were distributed to the destination zones observed from the surveyed sites on a proportional basis. It is assumed that the surveyed sites are representative of the most likely destination zones for the non-surveyed sites. Since the volume of vehicle trips at the non-surveyed sites is low, the amount of error that may be generated by that assumption is believed to be small.

For illustrative purposes, external-local and external-through travel in the Texarkana area was combined into location groups to show general travel movements in the Miller and Bowie county areas. Figure 18 shows the estimates of external-local trip movements by direction and location groups and Figure 19 shows the estimates of external-through trip movements between location groups.

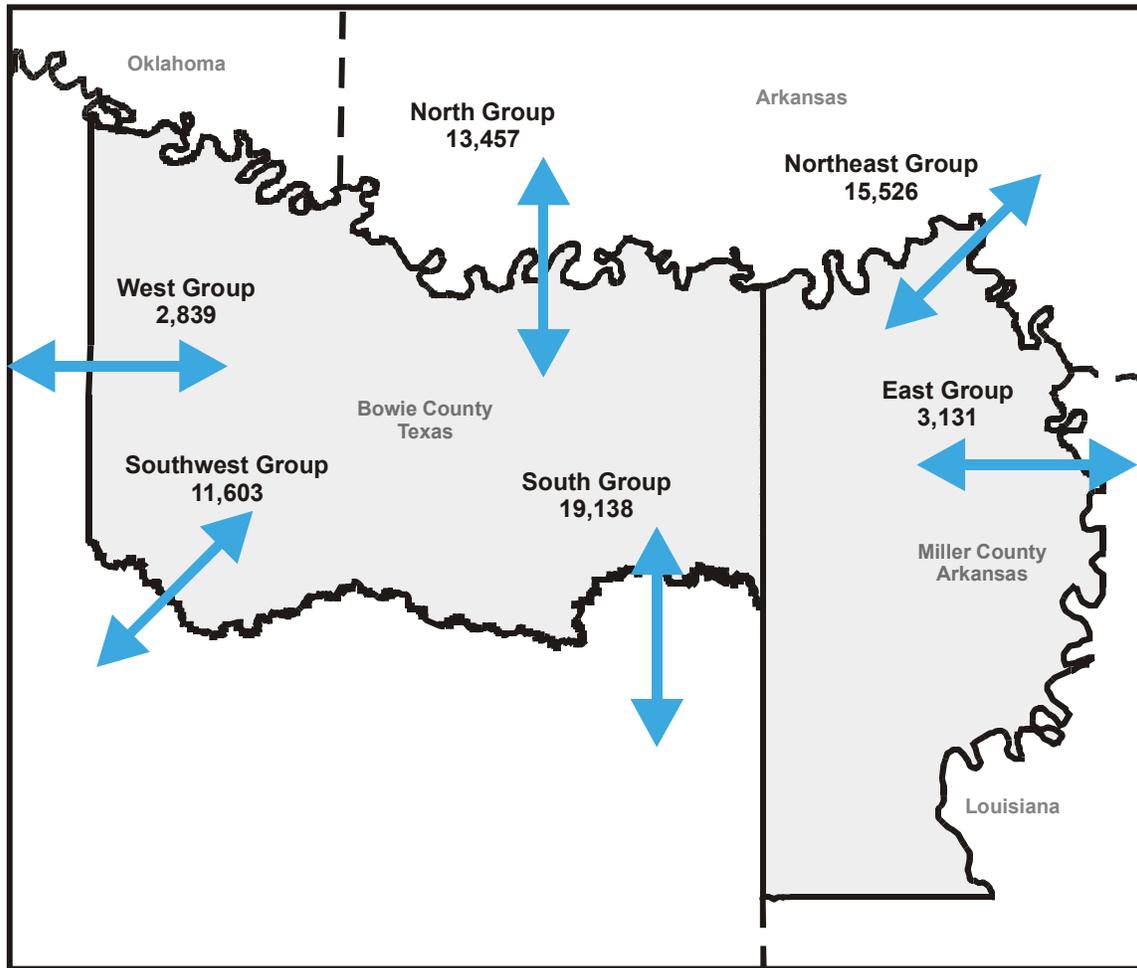


Figure 18. Estimates of External –Local Trip Movements by Location Group.

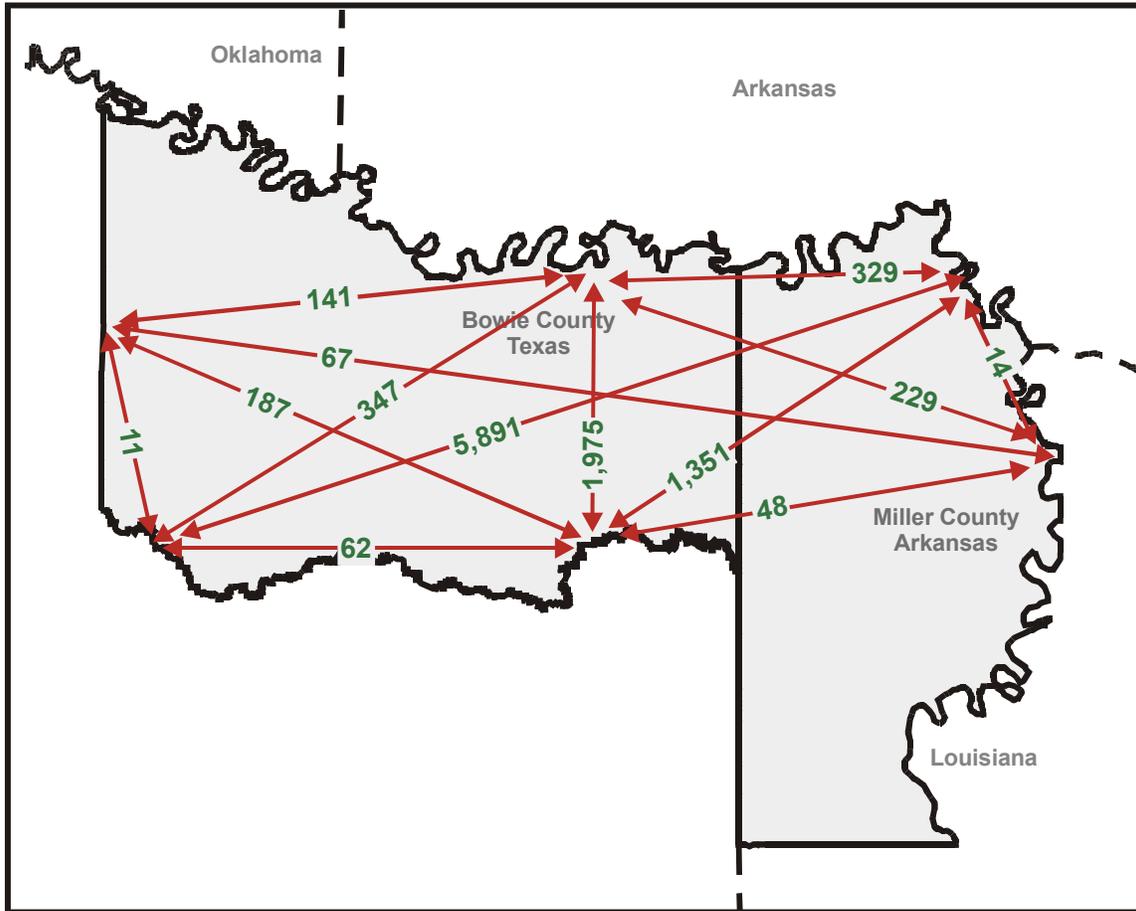


Figure 19. Estimates of Through Trip Movements by Location Group.

SURVEY SUMMARY

More than 90,000 vehicles enter and leave the Texarkana area (Bowie and Miller, counties) daily. Nearly 37 percent are commercial vehicles and just over 63 percent are non-commercial vehicles. Over one-fourth (27 percent) percent of the 90,000 vehicles are vehicles traveling through the area. Almost 75 percent of all trips enter or leave the Texarkana area via IH 30, US 59 South, and US 59/71 at the Texas/Arkansas border. Individuals that do not live in Bowie or Miller counties drive more than three-fourths of the non-commercial vehicles entering and leaving the Texarkana area.

Based on the average vehicle occupancy observed in the survey, an estimated 83,062 persons are entering and leaving Bowie and Miller counties daily by non-commercial vehicle and over

34,900 persons are entering and leaving by commercial vehicle. The estimated number of non-residents (persons that do not live in the Texarkana area) that enter Bowie and Miller counties daily via non-commercial vehicles is just over 63,700. Based on expansion of survey responses, internal travel within Miller and Bowie Counties by non-residents is estimated to be over 16,400 vehicle trips each day.

The majority of non-commercial trips were leaving home to go to some place other than work. These HBNW trips made up 43 percent of non-commercial trips in the Texarkana area. The NHB purpose accounted for 36 percent of non-commercial trips and the remaining 21 percent were HBW trips.

The primary purposes for commercial vehicle trips were for picking up and delivering cargo. Approximately 56 percent of the trip origin purposes were reported to be for picking up or delivering cargo, while picking up or delivering cargo was the stated purpose for 82 percent of the destination trips. Leaving base operations accounted for 16 percent of the commercial vehicle trip origins and 18 percent of the destination trips. For commercial vehicles carrying freight, the cargo classifications most reported included manufactured goods, wood products, and food/health/beauty products.

The distribution of non-commercial and commercial vehicles by time-of-day was somewhat similar between surveyed sites for traffic coming into the Texarkana area, but not as similar for traffic traveling out of the area. The distribution of non-commercial traffic revealed typical AM and PM peaking characteristics, while commercial traffic did not show noticeable peaks in its distribution.

There was little difference between the age of non-commercial and commercial vehicles in the Texarkana area. The average age was 7.99 years for non-commercial vehicles and 6.99 years for commercial vehicles. The average odometer reading for commercial vehicles (371,601) was over three times greater than that of non-commercial vehicles, which was 89,390. The average vehicle occupancy was 1.46 for non-commercial vehicles and 1.09 for commercial vehicles.

APPENDIX

TEXARKANA EXTERNAL STATION
NON-COMMERCIAL VEHICLE SURVEY FORM - A
 (Outbound Direction from Bowie/Miller Counties)

Station # _____ Survey Date _____
 Station Name/Location _____ Interviewer _____

For each vehicle you collect	Vehicle 1	Vehicle 2	Vehicle 3
Time	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.
Number of people in vehicle			
Vehicle Type			

Vehicle Type options: 1) Passenger (car/truck/van) 2) Bus 3) Taxi/Paid Limo 4) School Bus
 5) Commercial Vehicle (over 1 ton) 6) Motorcycle 7) Recreational Vehicle 8) Other (specify in block) 99) Refused/Unknown

QUESTIONS:	Vehicle 1	Vehicle 2	Vehicle 3
1. What year, make, and model is this vehicle? Gas (leaded, unleaded), diesel, propane or other fuel?	_____ Year _____ Make _____ Model Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other <input type="checkbox"/> _____	_____ Year _____ Make _____ Model Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other <input type="checkbox"/> _____	_____ Year _____ Make _____ Model Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other <input type="checkbox"/> _____
2. What is the mileage on your odometer?			
3. Do you live in Miller or Bowie County? 3a. What city do you live in?	<input type="checkbox"/> Miller County, AR <input type="checkbox"/> Bowie County, TX <input type="checkbox"/> No (go to 4)	<input type="checkbox"/> Miller County, AR <input type="checkbox"/> Bowie County, TX <input type="checkbox"/> No (go to 4)	<input type="checkbox"/> Miller County, AR <input type="checkbox"/> Bowie County, TX <input type="checkbox"/> No (go to 4)
4. What city and state to you live in? 4a. Did you stay overnight as part of your travel? 4b. Where did you stay? 4c. How many nights have you stayed? 4d. Did you enter / leave Texas today? 4e. Where inside / outside of Texas did you travel from? 4f. What road or highway did you use to enter / leave Texas?	_____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused <input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 4d) _____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused <input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 5) _____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused	_____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused <input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 4d) _____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused <input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 5) _____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused	_____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused <input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 4d) _____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused <input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 5) _____ _____ (city / state in US or Mexico) <input type="checkbox"/> Refused

5. Where was the last place you got into your vehicle (place/address or nearest intersection/city)			
5a. What time did you leave that place?	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.
5b. What type of place was that? (choose from type of place options)			
5c. What was your purpose for being at your last location? (Choose from trip purpose options)			
5d. Was that location in Bowie or Miller County?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused (Yes go to 6)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused (Yes go to 6)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused (Yes go to 6)
5e. What road/bridge did you use to enter Bowie/ Miller County?			

Type of Place Options: 1) Office Building (non government) 2) Retail/Shopping 3) Industrial/Manufacturing
4) Medical 5) Educational (12th grade or lower) 6) Educational (college, trade, etc) 7) Office Building (Government)
8) Residential 9) Airport 10) Eating Establishment 11) Other (specify) 99) Refused / Unknown

Trip Purpose Options: 1) Home/Return home 2) Go / Return to work 3) Work-related 4) School 5) Vacation
6) Visit Friends/Family 7) Eat out 8) Shop 9) Buy gas 10) Personal business 11) Pick-up/drop-off
passenger 12) Change travel mode 13) Delivery 14) Other (specify) 99) Refused/Unknown

6. Where is your next destination? (place/address or nearest intersection/city)			
6a. What is your purpose for traveling to this destination? (Choose from trip purpose options)			
7. Are you going to a location out of Texas / Arkansas?	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 7d)	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 7d)	<input type="checkbox"/> Yes <input type="checkbox"/> Refused <input type="checkbox"/> No (go to 7d)
If Yes: 7a. What city and state are you going to?			
7b. What road / bridge will you use to leave Texas / Arkansas?			
7c. How many more days will you be in Texas / Arkansas?			
If No 7d. What city / county in Texas /Arkansas are you going to?			

To measure the amount of travel you made today, we need to know the number of places you have gone today. Would you please tell us:			
8. Where did your first trip today begin? (city/county/landmark)			
9. Where did you go from there? (city/county/landmark)			
10. Where did you go next? (city/county/landmark)			
11. Where did you go next? (city/county/landmark)			
12. Where did you go next? (city/county/landmark)			
13. How many more places did you stop today?			

**TEXARKANA EXTERNAL STATION
COMMERCIAL VEHICLE SURVEY FORM B**
(Outbound Direction from Bowie/Miller Counties)

Station # _____

Survey Date _____

Station Name/Location _____

Interviewer _____

For each vehicle you collect:

	Vehicle 1	Vehicle 2	Vehicle 3
1. Time	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.
2. Number of people in vehicle			
3. Vehicle Classification			
4. What is the cargo (choose from vehicle cargo codes, if empty go to 12)			
5. Did you come from or is it going to Mexico?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown
6. Where did you pick up your load? (place/address or nearest intersection and city)			
7. Was that location an inter-modal transfer or custom brokerage site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown
8. How was your load transferred at that site (choose from transfer codes)?			
9. Where will you drop your cargo off? (place/address or nearest intersection and city)			
10. Is that location an inter-modal transfer or custom brokerage site?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Refused / Unknown
11. How will the cargo be transferred at that site (choose from transfer codes)?			

Vehicle Classification Options: 1) Single Unit 2-axle (6 wheels) 2) Single Unit 3-axle (10 wheels) 3) Single Unit 4-axle (14 wheels)
4) Semi (all tractor-trailer combinations) 5) Other (specify) 99) Refused / Unknown

Cargo Transfer Options: 1) Truck-to/from-Truck 2) Rail-to/from-Truck 3) Ship-to/from-Truck 4) Airplane-to/from-Truck
5) Warehouse-to/from-Truck 6) Pipeline-to/from-Truck 99) Unknown / Refused

NOTE: All cargo transfer options are both ways (i.e., Truck-to-Warehouse should be coded same as Warehouse-to-Truck).

QUESTIONS:

12. What is the year and gross weight rating of this vehicle ?	_____ Year	_____ Year	_____ Year
Gas (leaded, unleaded), diesel, propane or other fuel?	Gross Weight Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other <input type="checkbox"/> _____	Gross Weight Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other <input type="checkbox"/> _____	Gross Weight Leaded <input type="checkbox"/> Unleaded <input type="checkbox"/> Diesel <input type="checkbox"/> Propane <input type="checkbox"/> Other <input type="checkbox"/> _____
13. What is the mileage on your odometer?			

14. Where are you coming from? (city / state in US or Mexico)			
14a. Is that location in Texas?	<input type="checkbox"/> Yes (go to 14d) <input type="checkbox"/> No	<input type="checkbox"/> Yes (go to 14d) <input type="checkbox"/> No	<input type="checkbox"/> Yes (go to 14d) <input type="checkbox"/> No
14b. (<i>If not in Texas</i>) Did you enter / leave Texas today?	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 14d)	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 14d)	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 14d)
14c. What road or highway did you use to enter / leave Texas?			
14d. Did you stay overnight as part of your travel?	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 15)	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 15)	<input type="checkbox"/> Yes <input type="checkbox"/> No (go to 15)
14e. If yes, where did you stay? (city/county/state)			
14f. How many nights have you stayed?			
15. Where was the last place you got into your vehicle? (place/address or nearest intersection/city)			
15a. What time did you leave that place?	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.	_____ a.m. _____ p.m.
15b. What type of place was this? (choose from type of place options).			
15c. What was your purpose for being at your last location?			
15d. Was that location in Bowie or Miller County?	<input type="checkbox"/> Yes (Go to 16) <input type="checkbox"/> No <input type="checkbox"/> Refused	<input type="checkbox"/> Yes (Go to 16) <input type="checkbox"/> No <input type="checkbox"/> Refused	<input type="checkbox"/> Yes (Go to 16) <input type="checkbox"/> No <input type="checkbox"/> Refused
15e. What road / bridge did you use to enter Bowie/Miller County?			
16. Where is your next destination? (place/address or nearest intersection/city)			
16a. What is your purpose for traveling to this destination? (Choose from trip purpose options.)			
17. Are you going to a location outside of Texas / Arkansas?	<input type="checkbox"/> Yes (Go to 16) <input type="checkbox"/> No (go to 17d) <input type="checkbox"/> Refused	<input type="checkbox"/> Yes (Go to 16) <input type="checkbox"/> No (go to 17d) <input type="checkbox"/> Refused	<input type="checkbox"/> Yes (Go to 16) <input type="checkbox"/> No (go to 17d) <input type="checkbox"/> Refused
<i>If Yes</i> 17a. What city and state are you going to?			
17b. What road or highway will you use to leave Texas / Arkansas?			
17c. How many more days will you be in Texas / Arkansas?			
<i>If No</i> 17d. What city / county in Texas / Arkansas are you going to?			

Type of Place Options: 1) Office Building (non-government) 2) Retail/Shopping 3) Industrial/Manufacturing
 4) Medical 5) Educational (12th grade or lower) 6) Educational (college, trade, etc) 7) Office Building (Government) 8) Residential 9) Airport 10) Eating Establishment 11) Other (specify) 99) Refused / Unknown

Trip Purpose Options: 1) Base location/return to base location 2) Delivery 3) Pick-up
 4) Maintenance 5) Driver needs (lunch, etc.) 6) To Home 7) Buy fuel
 8) Other (specify) 99) Refused/Unknown

To measure the amount of travel you made today, we need to know the places you have gone today. Would you please tell us:

18. Where did your first trip today begin? (city/county/landmark)			
19. Where did you go from there? (city/county/landmark)			
20. Where did you go next? (city/county/landmark)			
21. Where did you go next? (city/county/landmark)			
22. Where did you go next? (city/county/landmark)			
23. Where did you go next? (city/county/landmark)			
24. Where did you go next? (city/county/landmark)			
25. How many more places did you stop today?			

Vehicle Cargo Codes

- | | |
|--|---|
| 1 – Farm Products | Livestock, fertilizer, dirt, landscaping, etc. |
| 2 – Forest Products | Trees, sod, etc. |
| 3 – Marine Products | Fresh fish, seafood, etc. |
| 4 – Metals and Minerals | Crude petroleum, natural gas, propane, metals, gypsum, etc. |
| 5 – Food, Health, Beauty Products | Assorted food products, cosmetics, etc. |
| 6 – Tobacco Products | Cigarettes, cigars, and chewing tobacco |
| 7 – Textiles | Clothing, lines, etc |
| 8 – Wood Products | Lumber, paper, cardboard, wood pulp, etc |
| 9 – Printed Matter | Newspapers, magazines, books, etc. |
| 10 – Chemical Products | Soaps, paints, household or industrial chemicals, etc |
| 11 – Refined Petroleum or Coal Products | Gasoline, etc. |
| 12 – Rubber, Plastic, Styrofoam Products | Finished products of rubber, plastic, or Styrofoam |
| 13 – Clay, Concrete, Glass, or Stone | Finished products of clay, concrete, glass, or stone |
| 14 – Manufactured Goods/Equipment | Miscellaneous products such as machinery, appliances, etc |
| 15 – Wastes | Waste products, including scrap and recyclable materials |
| 16 – Miscellaneous Shipments | U.S. Mail, U.P.S., Federal Express, and other mixed cargo |
| 17 – Hazardous Materials | Hazardous chemicals and substances |
| 18 – Transportation | Automobiles, Heavy Equipment, etc. |
| 19 – Unclassified Cargo | Cargo not falling within one of the above categories |
| 20 – Driver Refused to Answer | Driver refused to answer |
| 21 – Unknown to Driver | Unknown to driver |
| 22 - Empty | Empty |